

**REMARKS**

An excess claim fee payment letter is submitted herewith for four (4) additional independent claims.

Claims 1-25 are all the claims presently pending in the application. Claims 1, 9-10, 14 and 18 have been amended to more clearly define the invention and claims 21-25 have been added. Claims 1-2, 6-7, 9-10, 14, 16, 18, 21, and 23-25 are independent.

These amendments are made only to more particularly point out the invention for the Examiner and not for narrowing the scope of the claims or for any reason related to a statutory requirement for patentability.

Entry of this §1.116 Amendment is proper. Since the Amendments above narrow the issues for appeal and since such features and their distinctions over the prior art of record were discussed earlier, such amendments do not raise a new issue requiring a further search and/or consideration by the Examiner. As such, entry of this Amendment is believed proper and Applicant earnestly solicits entry. No new matter has been added.

New claims 21 and 23-25 are method claims that are based upon allowable claims 16, 6-7, and 9, respectively. Therefore, since claims 16, 6-7, and 9 are allowable, claims 21-25 do not raise new issues and are allowable.

Applicant also notes that, notwithstanding any claim amendments herein or later during prosecution, Applicant's intent is to encompass equivalents of all claim elements.

Applicant gratefully acknowledges the Examiner indicating that claims 2-9 and 16 are allowed. However, Applicant respectfully submits that all of the claims are allowable.

Claims 18-19 stand rejected under 35 U.S.C. § 112, second paragraph. Claims 1, 10, 14, and 18 stand rejected under 35 U.S.C. 102(e) as being anticipated by the Shimizu, et al.

reference (USPN 6,466,186). Claims 1, 9-15, and 17-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over the Awamoto, et al. reference (USPN 6,452,590), in view of the Minamibayashi reference (USPN 5,943,030)

These rejections are respectfully traversed in the following discussion

## **I. THE CLAIMED INVENTION**

An exemplary embodiment of the claimed invention, as recited by, for example, independent claim 1, is directed to a drive apparatus for a plasma display panel that includes an image signal accumulator that accumulates the intensity signals for a plurality of pixels to generate an accumulated intensity signal, an accumulated value comparator that compares the accumulated intensity signal to a prescribed value, and a charge recovery timing control circuit that controls the length of a charge recovery period during a sustaining period from a time at which a charge recovery operation of the charge recovery circuit starts to a time of fixing to a sustaining potential or a ground potential based upon the results of the comparison.

A conventional device for charge recovery on an alternating current type plasma display uses an inductive (LC) resonant circuit. If the time constant of the inductive (LC) resonant circuit is made large in order to achieve a sufficient recovery efficiency, the action of electrical charge recovery causes a loss of sharpness in the sustaining pulse applied to the scanning and common electrodes, so that there is a tendency for discharge to start before the drive voltage has risen completely. If discharge occurs midway during electrical charge recover, the discharge current is supplied from the LC resonant circuit rather than the power supply line. Since the energy stored in the conductance of the LC resonant circuit, the power supply capacity is reduced, which increases the voltage drop because of the discharge current.

This increase in the voltage drop weakens the discharge and reduces the intensity of the display.

The intensity of the display may be increased by providing a strong discharge.

Further, intensity of the display may also be improved by advancing the timing after the charge recovery. However, advancing the timing causes a decrease in the charge recovery efficiency and an increase in the variation in intensity which results from a variation in the display load that is established by the number of pixels in each display line.

Moreover, it is preferable to retard the timing after the charge recovery to reduce the variations in the intensity and, thereby, obtain a smooth gray-scale characteristic.

Thus, it has been difficult to balance the conflicting demands of advancing and retarding the timing after the charge recovery.

In contrast to the conventional display drive apparatus, the claimed invention includes a charge recovery timing control circuit that controls the length of the charge recovery period during a sustaining period of the charge recovery circuit based upon a comparison of an accumulated intensity signal with a prescribed value.

In this manner, the present invention is capable of controlling a clamp timing of the sustaining pulse to give priority to gray-scale characteristics when the display intensity is high and controlling a clamp timing of the sustaining pulse to give priority to the peak intensity when the display intensity is low.

## **II. THE 35 U.S.C. § 112, SECOND PARAGRAPH REJECTION**

The Examiner alleges that claims 18-19 are indefinite. This amendment amends claim 18 in accordance with Examiner Awad's very helpful suggestion.

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

### III. THE PRIOR ART REJECTIONS

#### A. The Shimizu reference

Regarding the rejection of claims 1, 10, 14, and 18, the Examiner alleges that the Shimizu reference teaches the claimed invention. Applicant submits, however, that there are elements of the claimed invention which are neither taught nor suggested by the Shimizu reference.

First, Applicant notes that the Examiner has failed to provide a prima facie case of anticipation.

*"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."* (Emphasis added, M.P.E.P. § 2131).

In the currently outstanding Office Action, the Examiner merely alleges that the claims of the Shimizu reference have "substantial similarities" with the independent claims of the present application. "Substantial similarities" is not the legal standard for a rejection under 35 U.S.C. § 102.

Accordingly, such an allegation is prima facie insufficient to establish a prima facie case of anticipation.

Indeed, the Examiner ignores the clear language of the claims. Independent claims 1, 10, 14, and 18 each recite accumulating the intensity of pixels in the plasma display panel and comparing the accumulated intensity with a prescribed value.

The Shimizu reference does not teach or suggest the feature of comparing the accumulated intensity with a prescribed value.

Moreover, the Examiner does not even allege that the Shimizu reference teaches or suggests the feature of comparing the accumulated intensity with a prescribed value.

Applicant's Amendment that was filed on December 16, 2003 pointed out that:

The '186 patent does not teach or suggest the features of the present invention including a charge recovery timing control circuit that controls the length of the charge recovery period of the charge recovery circuit based upon a comparison of an accumulated intensity signal with a prescribed value. As explained above, this feature is important for controlling a clamp timing of the sustaining pulse to give priority to gray-scale characteristics when the display intensity is high and controlling a clamp timing of the sustaining pulse to give priority to the peak intensity when the display intensity is low.

In stark contrast, the '186 patent appears to disclose lengthening the charge recovery period based upon the display load amount. Specifically, the '186 patent appears to disclose an arithmetic circuit 4 that detects the display load amount (col. 10, lines 19-21), lengthening the charge recovery period when the display load amount is small (col. 9, line 66 - col. 10, line 6), and shortening the charge recovery period when the display load amount is large (col. 10, lines 6 - 17).

The '186 patent also appears to disclose gradually the length of the charge recovery period as the display load amount increases (col. 8, lines 16 - 47).

The '186 patent does not appear to disclose the feature of a charge recovery timing control circuit that controls the length of the charge recovery period of the charge recovery circuit based upon a comparison of an accumulated intensity signal with a prescribed value. Indeed, the '186 patent does not mention anything at all relating to a prescribed value, let alone

controlling the length of the charge recovery period based upon a comparison of accumulated intensity with the prescribed value.”

The Response to Arguments section of the March 10, 2004 Office Action states:

*“Applicant argued that Shimizu (sic) does not teach charging recovery timing control circuit. However, as described in the rejection above, Shimizu (figure 7) fairly reads on the claimed limitation. Shimizu (sic) also teaches that the timing (length) of the charge recover periods varies based on the intensity (col. 9, line 66 through col. 10, line 17).”* (Emphasis added).

Here again, however, the Examiner continues to ignore the clear language of the claims and fails to provide any reference at all which teaches or suggests a charge recovery timing control circuit that controls the length of the charge recovery period of the charge recovery circuit based upon a comparison of an accumulated intensity signal with a prescribed value.

Applicant pointed out to the Examiner that the Shimizu reference does not mention anything at all relating to a prescribed value, let alone controlling the length of the charge recovery period based upon a comparison of accumulated intensity with the prescribed value. However, the Examiner makes absolutely no attempt whatsoever to cite any reference at all, let alone the Shimizu reference, which discloses the features that are clearly recited by the claims.

Therefore, the Shimizu reference does not teach or suggest each and every element of the claimed invention. Therefore, the Examiner is respectfully requested to reconsider and withdraw this rejection of claims 1, 10, 14 and 18.

**B. The Awamoto et al. reference in view of the Minamibayashi reference**

Regarding claims 1, 9-15, and 17-20, the Examiner continues to allege that the Minamibayashi reference would have been combined with the Awamoto et al. reference to form the claimed invention. Applicant submits, however, that these references would not have been combined and even if combined, the combination would not teach or suggest each and every element of the claimed invention.

Applicant submits that the Examiner can point to no motivation or suggestion in the references to urge the combination as alleged by the Examiner.

The Examiner alleges that it would have been obvious to one of ordinary skill in the art to modify the plasma display panel disclosed by the Awamoto et al. reference to control the timing of the charge recovery period as disclosed by the Minamibayashi reference in order to *“recover and reuse the electric charges applied during the data recover (sic) period, and since the data is variable, the timing of the recovery has to variably (sic) controlled.”*

Firstly, the claims of the present application have been amended to clarify that the charge recovery period is during a sustaining period. In contrast, while the Minamibayashi reference appears to disclose that the “operation period of the electric power recovery or release can be controlled by changing the transition of the recovery/release control pulse RC going to the logical high level, and the transition of the pulse STB” (col. 12, lines 52 - 56), none of the applied references teach or suggest controlling the recovery period during a sustaining period.

Rather, the Minamibayashi reference clearly explains that the Examiner’s reference to col. 12, lines 52-56 are only relevant to the data write period. The Minamibayashi reference describes the operation of the driver control circuit 310 with respect to the data write period at

col. 11, line 41 - col. 12, line 64.

Indeed, the Minamibayashi reference does not even begin describing the sustain pulse during a sustain discharge period until col. 12, line 65.

Additionally, even though the Minamibayashi reference appears to describe that the charge recovery period may be controlled during the data write period, the Minamibayashi reference does not explain why that period might be varied. The Minamibayashi reference does not explain that increasing and/or decreasing affects anything at all. Indeed, the Minamibayashi reference is completely silent as to the effects of varying the period.

Therefore, the Minamibayashi reference does not provide any suggestion or motivation for one of ordinary skill in the art to provide a display driving circuit that alters the recovery period during the data write period.

Secondly, as explained in the previous Amendment, the Examiner's alleged motivation is completely inapplicable because the device disclosed by the Awamoto et al. reference recovers and reuses the electric charges that are applied during the data recovery period (i.e addressing period: col. 2, lines 39-43), therefore, the device disclosed by the Awamoto et al. reference does not need to be modified in order to "recover and reuse the electric charges applied during the data recover (sic) period" as alleged by the Examiner. Indeed, the Awamoto et al. reference is specifically directed at reducing the power consumed during the addressing period (col. 2, lines 23-25 and 31-33).

In response to the Applicant pointing out that the Examiner's alleged motivation is completely inapplicable, the Examiner merely states that "examiner also believes that the motivation clearly states that the teaching of the secondary reference is combinable with the main reference."



Applicant respectfully submits that the Examiner's "belief" is prima facie insufficient to establish a prima facie case of obviousness.

Further, the Examiner's assertion that the "secondary reference is combinable with the main reference" is also prima facie insufficient to establish a prima facie case of obviousness.

Indeed, the Applicant has never alleged that the references are not "combinable." Rather, the Applicant has alleged that the Examiner has failed to establish a prima facie case of obviousness because of the Examiner's failure to provide a motivation for one of ordinary skill in the art to combine the references in the manner alleged by the Examiner.

In order to establish a prima facie case of obviousness, the Examiner is required to do more than merely allege that the references "are combinable."

Applicant respectfully directs the Examiner's attention to M.P.E.P. § 2143.01 which sets forth in **bold and CAPITAL letters**:

**"FACT THAT REFERENCES CAN BE COMBINED OR MODIFIED IS NOT SUFFICIENT TO ESTABLISH PRIMA FACIE OBVIOUSNESS"**

In this instance, the Examiner has failed to provide a prima facie case of obviousness because of the failure to cite any part of the applied references that would motivate one of ordinary skill in the art to combine the teachings of the references in the manner that is alleged by the Examiner.

Moreover, even assuming arguendo that one of ordinary skill in the art would have been motivated to combine these references, the combination would not teach or suggest each and every element of the claimed invention.

That is, none of the applied references teaches or suggests the features of the present invention including a charge recovery timing control circuit that controls the length of the

charge recovery period during a sustaining period of the charge recovery circuit based upon a comparison of an accumulated intensity signal with a prescribed value. As explained above, this feature is important for controlling a clamp timing of the sustaining pulse to give priority to gray-scale characteristics when the display intensity is high and controlling a clamp timing of the sustaining pulse to give priority to the peak intensity when the display intensity is low.

Contrary to the Examiner's allegations, the Awamoto et al. reference does not teach or suggest controlling the charge recovery period. Rather, the Awamoto et al. reference explains that the inductance values of the inductors 51 and 52 "should be set so that the necessary time for charging and discharging becomes sufficiently short in the case of the maximum load where a target of charging and discharging is the sum of the interelectrode capacitance Ca. In other words, the Awamoto et al. reference teaches building the power recycling circuit by selecting inductors that have inductances which are based upon the design of the interelectrode capacitance Ca." (Emphasis added, col. 10, lines 8-14). Thus, once the inductances are set (i.e. the inductors are selected) and provided to the power recycling circuit, the inductances do not change.

In other words, the Awamoto et al. reference is explaining that the necessary time for charging and discharging are designed into the display driver and that this period of charge recovery is based upon the inductances values of the inductors that are selected and built into the display driver circuit. This selection of inductance values is performed by a designer.

This is in stark contrast to the present invention, which provides a circuit that can actively vary the charge recovery period during operation. Therefore, the Awamoto et al. reference does not teach or suggest controlling the charge recovery period.

The Minamibayashi reference does not remedy the deficiencies of the Awamoto et al.

reference.

The Examiner alleges that the Minamibayashi reference discloses controlling the charge recovery period. The Examiner cites column 10, lines 13-21 in an attempt to support this allegation.

However, contrary to the Examiner's allegation column 10, lines 13-21 does not disclose controlling a charge recovery period. Rather, column 10, lines 12-22 of the Minamibayashi reference explains that "the driving pulse is similar to the driving of the scan pulse in the point that the electrodes are individually driven, but different from the driving of the scan pulse, in the point that an indefinite number of electrodes are driven with an indefinite pulse width, since the elementary driver 21 drives the corresponding data electrode on the basis of display data." In other words, this portion of the Minamibayashi reference explains that the width of the driving pulse varies based upon the display data.

Therefore, the Examiner's citation of column 10, lines 13-31 has absolutely nothing to do with controlling of a charge recovery period. Rather, it only relates to the varying pulse width of a driving pulse.

Further, the independent claims have been amended to clarify that the charge recovery period is during a sustaining period as opposed to a data writing period. While the Examiner's citation of column 12, lines 52-65 of the Minamibayashi reference appears to disclose varying the charge recovery period, it only discusses varying the period during a data write period. The Minamibayashi reference does not teach or suggest varying the charge recovery period during the sustaining period.

Regarding claim 9, the Applicant again points out that, contrary to the Examiner's allegations, while the Awamoto et al. reference discloses a power supply, the Awamoto et al.

reference does not teach or suggest a power consumption detection circuit that measures a power consumption of the plasma display panel, and a charge recovery timing control circuit that controls the length of a charge recovery period during a sustaining period based upon the power consumption.

In response to this traversal of the Examiner's allegation, the Examiner states:

*"Awamoto (sic) show (sic) power supply (24), such supply usually indicates the amount of power to be consumed in certain time."* In other words, the Examiner appears to attempt to allege that the power supply inherently indicates the amount of power consumed in a certain amount of time simply because power supplies usually indicate the amount of power consumed in a certain amount of time.

Such an allegation of inherency is prima facie insufficient absent evidence tending to show inherency. *"To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.'" (M.P.E.P. § 2112).* In this instance, the Examiner has provided absolutely no extrinsic evidence that tends to prove: 1) that the missing descriptive matter is necessarily present in the thing described in the reference; and 2) that it would be so recognized by persons of ordinary skill.

Further, the Examiner appears to continue to ignore the clear language of claim 9. Claim 9, in pertinent part, reads "controlling the length of a charge recovery period . . . based upon the power consumption." Thus, even assuming arguendo that the power supply inherently indicates the amount of power consumed, the Examiner has failed to provide any citation to any prior art reference that teaches or suggests controlling the length of a charge recovery period based upon the power consumption.

Therefore, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 1, 9-15, and 17-20.

### III. FORMAL MATTERS AND CONCLUSION

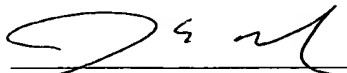
In view of the foregoing amendments and remarks, Applicant respectfully submits that claims 1-25, all the claims presently pending in the Application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the Application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

Date: 6/9/04

  
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